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Multilateral Intermediation of Foreign Aid: What is the Trade-Off for Donor Countries?

by

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Abstract[1]

Why would bilateral donors intermediate aid through a multilateral and not extend aid directly? This paper suggests a trade-off: multiple bilateral donors for each recipient may imply coordination and strategic problems but intermediating through a multilateral may dilute individual donor objectives. The paper conducts traditional panel and truly bilateral regressions with bilateral-pair, fixed effects to model aid allocation decisions. The results confirm that politics is important for bilateral donors but also that aid fragmentation and strategic behavior affect aid allocation. Multilaterals solve strategic and coordination problems between donors and, while politics remains significant, there is some evidence for a dilution of this effect.

Keywords: Aid, Capital Flows, Multilaterals, Panel
JEL Codes: F34, F35, O19

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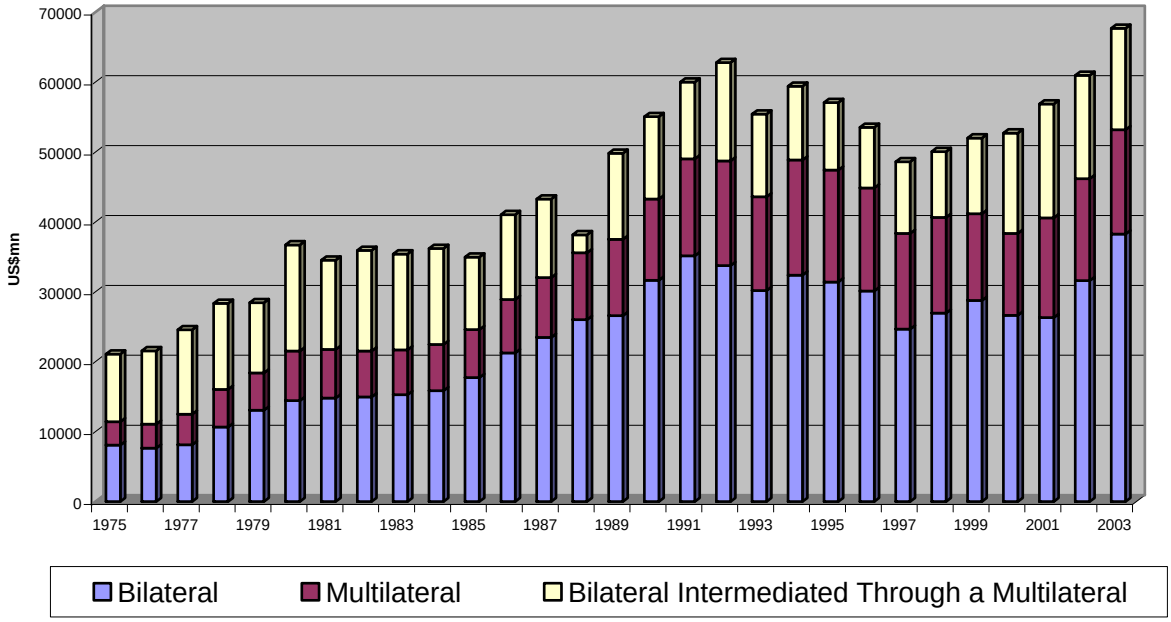
1. Introduction

Foreign aid net flows have risen over the last few years to reach US$67.5bn in 2003. Some 55.5 percent of this total was in the form of direct bilateral aid from the 22 bilateral donors tracked in the OECD ODA database, 22 percent was aid financed and extended by multilaterals and 21.5 percent was aid financed by bilaterals but intermediated through a multilateral.[2] Total aid to developing countries is graphed in Figure 1 from 1975 to 2003.[3]

Figure 1. Foreign Aid to Developing Countries



The objective of this paper is to extend the small but growing literature on the *determinants* of aid flows. This is important for a number of reasons, first to shed light on donors' aid policies and the role of multilateral versus bilateral agencies. Second, in our view if we understand better the allocation of aid then we may also learn why aid is sometimes not as effective as we would like.[4] Third, the policies of granting aid over time have led to a significant

[2] The bilateral aid donated through multilaterals is typically administered in the form of trust funds and other vehicles apart from aid financed by a multilaterals' own resources.
[3] Data from the OECD's Official Development Assistance database.
[4] On the effectiveness of aid on growth see for example Burnside and Dollar (2000), Easterly (2004), Rajan and Subramanian (2005) and the discussion in Radelet (2006). Radelet claims there are three views regarding the effectiveness of aid in growth: a) a positive, probably non-linear relation (diminishing returns), b) no relation (or

stock of non-grant assistance that has given rise to a debate on debt relief. While we do not discuss debt relief in this paper, the efficacy of debt relief is tied to the role and effectiveness of aid which again, in our view, may be driven by how aid is allocated.[5]

The literature on aid allocation has stressed that donors may be influenced by political or other ties to recipients. We confirm these results below, but we also stress that there may be interaction effects *between* donors. Some authors have alluded to a problem regarding aid fragmentation, and others that donors may interact strategically, although we know of no systematic empirical analysis of these issues in relation to aid allocation.[6] In Figure 2, we illustrate the aid extended by donors to each of the 149 recipients that received some positive aid from at least one donor over the last five-year period of our data. Aid is indeed highly fragmented: no fewer than 28 recipients received aid from all 22 donors in the database, and the median number of donors for each recipient is 10.

In the next section, we discuss the literature regarding the determinants of aid flows in the context of our aim to compare bilateral and multilateral aid allocation. In Section 3 we use that discussion to motivate our main research questions and explain our methodology. In Section 4 we present the results of the empirical exercises, and in Section 5 we present the conclusions.

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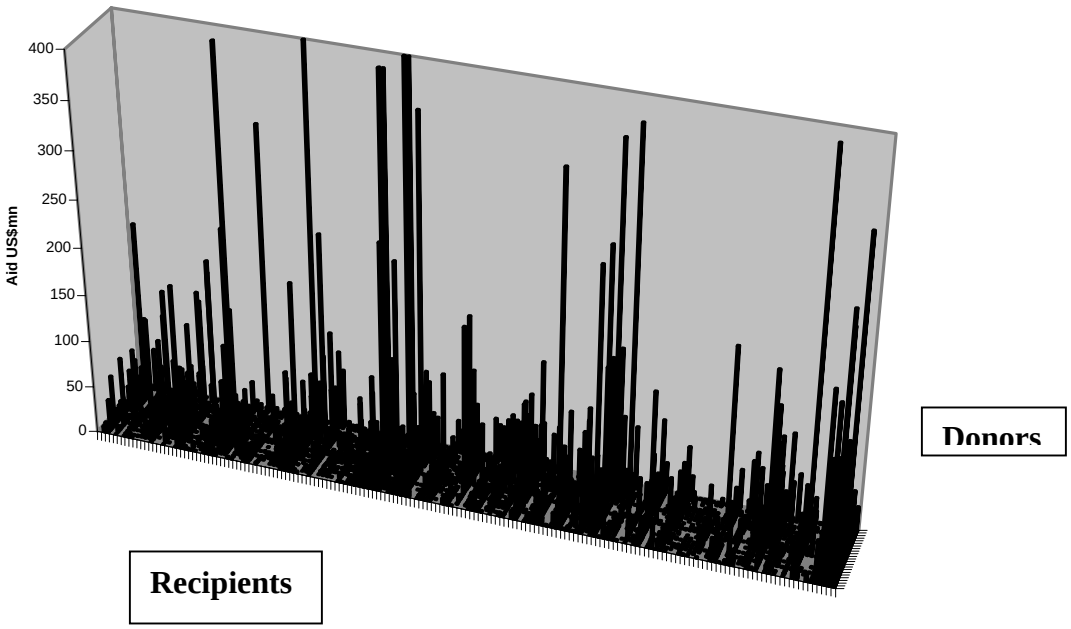
even a negative relation), and c) a conditional relation (dependent on the characteristics of recipient policies or of donors). He suggests the former has been heavily researched but not the latter. Our contribution is that we consider both donor *and* recipient characteristics.

[5] For example, see Birdsall et al. (2001), who argue that debt relief may be better than aid, as debt relief may be expected to be "less tied" than aid.

[6] On aid fragmentation, Radelet (2006), Knack and Rahman (2004) and Roodman (2006) suggest that many bilateral agencies and a proliferation of aid projects may overburden recipient governments and decrease bureaucratic quality in recipients. On strategic effects, Torsvik (2005) suggests that if donors cooperate they may not be able to credibly restrict aid, and this may then blunt recipients' incentives to reform.

Figure 2. Aid Fragmentation



Note: In this figure we curtail those observations greater than US$400 million.

2. Aid Allocation: Bilaterals versus Multilaterals

The small but growing literature on aid allocation has focused on explaining the pattern of bilateral aid. Trumbull and Wall (1994) develop a simple model of bilateral aid flows and conduct a panel data analysis across recipient countries including variables to reflect aggregate economic ties. Alesina and Dollar (2000) compare bilateral aid flows to private FDI flows, arguing that the former are driven more by politics and the latter more by economics. They argue that individual bilateral donors differ in their preferences and conduct regressions for individual donors. On the other hand, Chong (2006) suggests that a set of donor characteristics may be important in explaining aid patterns. Motivated by a theoretical model, he suggests that donor size, donor institutions (lack of corruption, etc.), tax revenues and donor equality may all affect (positively) aid extended.

In this paper, we suggest that bilaterals may face a trade-off. On the one hand, a bilateral may wish to pursue its own objectives, whether they be altruistic, political or economic, while on

the other hand several bilaterals lending to each recipient may create a set of inefficiencies. Then again, bilaterals may use multilaterals to intermediate assistance. In this paper we consider two types of multilateral intermediation.

Multilaterals, initially financed by bilaterals through injections of capital, may finance aid from their own resources, generally from retained profits. There is a small literature on multilateral lending more generally. Regarding general IFI lending, Faini and Grilli (2002) argue that politics is important for IFI behavior and for the World Bank in particular. Barro and Lee (2005) suggest that political factors affect IMF lending. This is confirmed in Bobba (2004). Our prior is that, while multilaterals may not eliminate politics as a determinant of aid allocation, they are likely to dilute the particular wishes of each bilateral donor. To date, we do not know of any work that attempts to compare the aid allocation decisions of bilaterals versus multilaterals.

Another possibility is for a bilateral to give aid to a multilateral to administer through the medium of trust funds or other vehicles. Bilaterals may impose restrictions on the use of these "donations," and thus the determinants of bilateral aid allocation may still be relevant. However, if aid is administered by a multilateral, whether it is financed by bilaterals or the multilateral's own resources, one might expect fragmentation and strategic problems to be significantly reduced. We do not know of previous work that takes advantage of the OECD data on bilateral funds extended to multilaterals to analyze these propositions and hence consider this to be a further contribution of this paper.

Aid fragmentation problems may occur in the planning, implementation and monitoring phases of a particular project and may also be related to more general macroeconomic policies. Rodrik (1995) for example, argues that multilaterals may have a comparative advantage over bilaterals in imposing conditions in loan contracts. It might also be noted that multilaterals tend to be more senior than bilaterals when it comes to debt restructurings, suggesting a comparative disadvantage for bilaterals in lending to a sovereign.[7,8]

Coordination problems suggest that a bilateral lender may prefer to finance where other bilaterals are not present. Indeed, it might be argued that if a single bilateral extends finance to a

[7] A country might attempt to selectively default on one bilateral, hoping that relations with others will not be affected although the Paris Club attempts to prevent such behavior. See Paris Club, http://www.clubdeparis.org/en/presentation/presentation.php?BATCH=B01WP04

[8] Argentina currently remains in default with its bilateral lenders—and has not started negotiations—but remains current on its payments to multilateral lenders. The World Bank's 2005 annual report lists only five countries in arrears with that institution.

single recipient, then multilateral intermediation would not be required, as the single bilateral would internalize any inefficiencies arising from the presence of many donors. If bilaterals care about aid effectiveness, and this is reduced due to aid fragmentation, then the amount of aid from each donor may depend on measures of aid concentration. This argument suggests that the more concentrated is bilateral lending (across donors for a single recipient), then the more bilateral lending a recipient may receive.

Donors may also act strategically in several different ways. If donors care about recipient welfare and hence the total amount of aid given, then one donor may free-ride on the aid of another, reducing overall levels of aid. Torsvik (2005) suggests that if donors cooperate then they may extend more aid, but this may then blunt recipients' incentives to reform. On the other hand, donors may compete for favors from a recipient government. Favors may take the form of political support in international dealings or purchasing equipment or services from donor countries' firms. Competition in this dimension may lead to aid from different donors becoming strategic complements rather than substitutes, and the result might be too much (perhaps ineffective) aid relative to some cooperative benchmark. As is common in game theory, specific results are likely to depend on the type of competition posited and the possibilities of cooperation developing. We therefore remain agnostic as to the effect of strategic effects on the total quantity of aid extended and suggest that this is an empirical question, to be analyzed confronting the data.

3. Data Description

We constructed two databases to consider bilateral and multilateral aid allocation decisions. The first is a traditional panel database including aid for each recipient country over time, with annual data from 1970-2003. The second is a database that is organized both by recipient and by donor, the latter including the 22 nations that are included in the OECD database on development assistance. Both databases include direct bilateral aid, aid financed by multilaterals' own resources and aid given to multilaterals from bilaterals. In the last case, in the database that is organized by donor and by recipient, the amount an individual donor gives to an individual recipient is imputed from the total extended from each donor to each multilateral and the amount given from that multilateral, out of those funds, to each recipient. We provide further details on data sources and definitions in Appendix 1.

Following the previous literature, we develop several variables to explain aid allocation. Regarding politics, we define political ties as the correlation between the voting pattern of the recipient and donor countries in the UN General Assembly (UNGA). In the traditional panel database we only employ political ties (correlation of voting patterns) with the US. However, we note that the voting pattern across G7 countries is highly correlated, so this variable can be interpreted as political ties with G7 countries.[9] In the database that discriminates across individual donors we employ the actual bilateral correlation of voting patterns between donor and recipient.

In order to assess the importance of economic links, we define a variable that summarizes economic ties. In the traditional panel database, this variable is the sum of trade, foreign direct investment and bank claims from the 22 bilateral donor countries. In the database that discriminates across donors, this variable is the sum of bilateral trade, bilateral FDI and bilateral bank claims. In the regressions we use the log of this variable.

We employ various recipient characteristics in our regressions following the literature. These include GDP per capita to assess whether aid tends to go to poorer countries, per capita growth, an openness index and an index of how democratic the recipient countries' political institutions are. The last two controls are an attempt to see if donors favor countries that are either more open or more democratic when it comes to allocating aid.

Given the arguments that the concentration of bilateral aid to a particular recipient may affect the relative efficiency of bilateral lending, we define the Herfindahl index of bilateral lending. The Herfindahl index is simply the sum of the square of the lending shares and runs from zero to one.[10] The definition of this variable is common to both databases.

In he database with both donors and recipients identified, we employ two further variables to capture strategic effects: a) the amount of aid that comes from all other donors excluding the individual donor in question, and b) the total number of donors. The first variable should capture the slope of the reaction function. Hence, if aid flows from different donors are strategic complements (positively sloped reaction functions), we would expect a positive coefficient on this variable, whereas if they are strategic complements (negative sloped reaction

[9] We find correlation coefficients of greater than 0.7 across G7 countries.

[10] The Herfindahl index is defined as the sum of the square of the relevant shares If a recipient received an equal amount of bilateral aid from two donors then this variable would be 0.5 and if it received aid from a very large number of donors then it would be close to zero.

function) we would expect a negative coefficient. The second variable captures whether the total amount of aid extended by each donor depends positively or negatively on the total number of donors. If donors cooperate we would expect this variable not to be significant. If more donors results in less aid per donor (a negative coefficient), this result would indicate free-riding. If more donors results in more aid per donor as a percentage of recipient GDP then, controlling for other factors, this would be consistent with a non-cooperative aid-for-favor game.

4. Empirical Specifications and Results

4.1. Bilateral and Multilateral Aid by Recipient, Traditional Panel Regressions

Our basic econometric model can be represented as follows:

$$(1) \qquad aid_{jt} = \alpha + \beta RECIP_{jt} + \delta TIES_{jt} + \gamma HINDEX_{jt} + \eta_j + \nu_t + \varepsilon_{ijt}$$

where j=1,……,175 recipients and t=1,…,7 five-year intervals spanning the period 1970-2003. Our dependent variable is total bilateral or multilateral Official Development Assistance (ODA) net flows divided by the GDP of the recipient.[11] *RECIP* is a vector of recipient economic characteristics that includes GDP per capita and GDP per capita growth, as well as indices for democracy and trade openness. *TIES* is a vector of time varying bilateral variables that includes economic ties (represented by the log of the sum of trade, FDI and bank claims between each recipient and *all* 22 donors), and political ties (represented by the correlation of UN voting with the United States). *HINDEX* is the Herfindahl index, which is the sum of the squares of the lending shares of each bilateral donor in each recipient. η_j is a recipient country fixed effect that controls for any other time-invariant characteristic (including a colonial relationship with any donor or geographic or strategic position, for example; such regressions often include a dummy for Israel and Egypt) that may affect aid allocation decision, and ν_t are time dummies controlling for potential common trends.[12]

Table 1 illustrates the estimation results of equation (1). We report results for bilateral aid, multilateral aid, aid financed by bilaterals intermediated by multilaterals and in the final column a regression specifically for the World Bank. In common with the findings in the

[11] In our analyses, we do not include multilateral lending as a determinant of bilateral and vice versa. We did try this, and we sometimes found the relevant variable significant. Generally we did not, however, and we found little change with respect to the other coefficients or their significance reported below.

[12] In this traditional panel we focus on recipient variables so do not introduce donor effects.

literature, we find evidence that relative to recipient GDP, more aid is extended to small countries and that politics is a significant determinant of aid allocation.

Table 1. Aid Determinants: Traditional Panel Model

(Dependent Variable is Aid/GDP from Different Sources as Indicated)

	(1) Bilateral	(2) Multilateral	(3) Bilateral via Multilaterals	(3) World Bank
GDP (Log)	-50.821	-23.254	-23.261	-5.373
	(3.29)***	(2.43)**	(2.91)***	(0.95)
GDP Per Capita Growth (t-1)	-9.691	0.176	-8.021	0.762
	(2.04)**	(0.06)	(1.74)*	(0.40)
GDP Per Capita (Log)	40.490	13.461	16.659	4.269
	(2.36)**	(1.13)	(1.69)*	(0.65)
Openness	-3.676	1.051	-0.061	2.553
	(1.31)	(0.41)	(0.04)	(1.48)
Democracy Index	0.066	-0.360	-0.734	-0.266
	(0.19)	(1.32)	(2.84)***	(1.56)
Economic Ties (Log)	0.104	0.629	0.701	0.274
	(0.06)	(0.43)	(0.56)	(0.15)
UN Alignment with US	16.137	10.421	10.476	5.109
	(2.95)***	(2.68)***	(2.38)**	(2.17)**
Hindex	15.882	2.970	-1.402	2.537
	(3.37)***	(0.65)	(0.48)	(0.73)
Constant	-129.774	-20.920	-54.402	-13.407
	(1.51)	(0.33)	(1.06)	(0.36)
Observations	323	323	284	251
Number of id	94	94	81	73
R-squared	0.35	0.15	0.36	0.11

Robust t statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%

All regressions include fixed effects.

As well as confirming the results in the literature, we also find a strong Herfindahl effect for bilateral aid. This means that when bilateral lending becomes more concentrated, bilateral lending tends to increase. We interpret this result as evidence of an aid fragmentation effect as, conversely, if aid becomes more fragmented then less aid is extended. Note that this variable is not significant for multilateral aid nor for bilateral aid extended via multilaterals.

We also ran a set of "difference-in-difference" equations or, in other words, regressions with fixed effects (similar to taking first differences) but where the dependent variables were a) bilateral aid minus multilateral aid, b) bilateral aid minus bilateral aid intermediated via multilaterals, and c) bilateral aid minus World Bank aid. We then particularly considered whether the coefficient on politics and on the Herfindahl index was significant to assess whether there is evidence that multilaterals dilute the effect of political alignment or solve coordination problems. The results are presented in Table 2 below.

Table 2. Tests for Multilateral Dilution of Politics and Fragmentation

	(2) **Bilateral - Multilateral**	(3) **Bilateral - Bilateral via Multilateral**	(3) **Bilateral - World Bank**
UN Alignment with US	5.715	8.226	17.710
	(1.18)	(1.73)*	(3.20)***
Herfindahl Index	12.912	18.343	19.500
	(3.04)***	(4.01)***	(3.43)***

Note that the coefficient on the Herfindahl index is positive and significant, indicating that multilateral intermediation does appear to reduce problems of aid fragmentation. Indeed, as this coefficient was not significant for multilateral aid in Table 1, the evidence suggests that multilateral intermediation may solve this particular problem. We also find the coefficient on the political alignment variable to be positive and significant for the case of bilateral aid minus World Bank aid and significant at the 10 percent level for bilateral aid intermediated through multilaterals. There is then some evidence for a dilution effect, although we note that we cannot reject the hypothesis that the coefficient on bilateral minus aggregate multilateral aid is not significant.[13]

However, in the regressions above, we are not exploiting the fact that we may identify individual bilateral donors as well as individual recipients. By separating out both the donor and the recipient dimension we can analyze strategic effects between donors, test whether it is

appropriate to pool across donors (taken as given above), and control for any possible unobservable donor-recipient bilateral characteristic that do not vary over time. This provides a substantial improvement, as in the regressions the above we only control for recipient fixed effects.

4.2 Donors' Aid Pushing, Coordination and Strategic Behavior

In this section, we turn to our second database that considers bilateral assistance from individual donor countries to individual recipients. Our basic empirical model is now of the following form:

$$(3) \qquad \begin{aligned} aid_{ijt} &= \alpha + \beta DONOR_{it} + \chi RECIP_{jt} + \delta TIES_{ijt} + \gamma HINDEX_{jt} \\ &+ \phi STRATEGIC_{ijt} + \eta_{ij} + \nu_t + \varepsilon_{ijt} \end{aligned}$$

where i=1,…., donors, j=1,……,175 recipients and t=1,…,7 five- year intervals spanning the period 1970-2003. The dependent variable is now ODA net flows divided by GDP for each individual donor, either bilateral or multilateral. *ECON* represents the economic variables of the recipient and does not vary across donors. It therefore does not change from any aggregate specification of equation (1). DONOR are now variables that capture donor characteristics that change over time, as suggested by Chong (2006), including GDP and Institutional Quality (the ICRG index). Recipient characteristics include GDP and GDP per capita. *TIES* is now a vector of truly bilateral variables that reflect economic (trade plus FDI plus bank claims) and political alignment (the correlation of voting in the UN general assembly) between specific donors and recipients. $HINDEX_{jt}$ is the Herfindahl index of aid concentration, and $STRATEGIC_{ijt}$ are variables that capture Strategic Interactions between donors, η_{ij} are the donor-recipient fixed effects controlling for other possible time invariant relations between donors and recipients that might affect aid allocation decisions, and ν_t is the usual time effect. This model is then much more general than those found in the literature to date, as we include Recipient effects, Donor effects, Ties and variables to capture coordination and strategic effects.

Still, equation (3) depicts a pooled model where we have just one coefficient for each of our variables of interest and hence the coefficient is assumed to be the same across all donors. In

[13] In separate tests not reported here we find that politics (U.S. alignment) is not significant in a regression of aid from Regional Development Banks. Note that typically the United States and G7 have lower voting shares in these organizations relative to the World Bank.

the appendices we present the results of an unrestricted model with direct bilateral aid as the dependent variable and a set of F tests to test whether pooling is rejected by the data. We ran regressions for different numbers of donors. As more donors are added, the procedure of running the unrestricted regression and testing for similar coefficients becomes more and more cumbersome. The results for the top five donors, namely the United States, Japan, France, Germany and United Kingdom, and results for the top 10 donors are presented in Appendix 3 with relevant F tests for pooling in Appendix 5. The main result of these experiments is that, with fixed effects added, we cannot reject pooling. Specifically, we find we cannot reject pooling for Political Alignment, Economic Ties, and GDP per capita, nor for the indicator of quality of Democracy.[14]

We also explored the effects of aid fragmentation and strategic interactions between donors. As discussed, fragmentation may reduce the effectiveness of aid and donors may then extend less aid, so we include the Herfindahl index of aid concentration. We expect this to have a positive coefficient if aid fragmentation decreases aid. To capture potential strategic interactions we include two further variables. First, we use aid from Other Donors, excluding aid from the individual donor in question. This variable then varies across donors, recipients and time. Second, we include the number of donors. Our idea is that if donors compete for favors using aid, then we would expect a positive coefficient for these two variables, suggesting positively-sloped reaction functions. On the other hand, if donors free ride on others' aid we would then expect a negative coefficient on these variables, suggesting a negative reaction function.

The results are included in Table 3. We find that donor characteristics do help to explain donor-recipient aid patterns. Donor GDP is significant in all specifications so larger donors give more aid as a percentage of recipient GDP. The donor ICRG (institutional quality) index is significant with a positive sign in the specifications with fixed effects. With respect to ties, we also find that political alignment is significant across all specifications, confirming that political ties matter for bilateral aid determination.[15] Without the fixed effects, as expected we find colony and common language to be significant, confirming the previous results in this literature.

[14] Without fixed effects, pooling is rejected for a number of variables. For example, the colony variable in the unrestricted model is relevant for France but less relevant for other donors.

[15] All the tie variables now refer to the actual tie between donor and recipient (i.e., UN alignment is the correlation between the individual recipient and the individual donor voting in the UN).

We also find Economic ties to be significant, although this variable loses significance when fixed effects are added.

In terms of the strategic variables, we illustrate different specifications in Table 3. When we properly control for non observables with fixed effects, the Herfindahl index is always significant. If we include the number of donors variable, then and the variable representing Other Donors' aid is not significant.. There is no evidence for co-linearity between these variables and our preferred specification is the last column with the Herfindahl index and the Number of Donors. The conclusion is that there is evidence of an aid fragmentation effect given the importance of aid concentration (Herfindahl) and that the aid packages of different donors are strategic complements given the positive coefficient on the number of donors.

We can also run regressions identifying individual donors and recipients for bilateral aid that is intermediated via multilaterals through trust funds and other vehicles. The comparison between direct bilateral aid and aid intermediated through multilaterals is of interest to see what role multilaterals might play in altering aid allocation and hence (perhaps) its effectiveness. In Table 3 we present our preferred specification for bilateral aid (the last column of Table 3), the same specification for bilateral aid intermediated through multilaterals. Both of these regressions include fixed effects and hence are akin to regressions in first differences. In the final column of Table 4, we also present a difference in difference regression of bilateral aid minus bilateral aid intermediated through multilaterals to see if there are significant differences between the two.

Table 3. Aid Determinants: Pairwise Regressions
(Dependent Variable is Bilateral Aid/GDP Recipient)

Model	(1) Pooled OLS	(2) Pairwise FE	(3) Pairwise FE	(4) Pairwise FE
Donor Characteristics				
GDP (Log)	1.393	4.580	4.529	4.492
	(5.85)***	(5.68)***	(5.59)***	(5.56)***
Institutional Quality (ICRG Index)	-0.040	0.547	0.555	0.544
	(0.82)	(3.15)***	(3.14)***	(3.13)***
Recipient Characteristics				
GDP (Log)	-0.784	-1.342	-1.506	-1.700
	(7.96)***	(1.23)	(1.36)	(1.57)
GDP Per Capita (Log)	-0.749	0.703	0.454	0.958
	(7.79)***	(0.63)	(0.40)	(0.85)
GDP Per Capita Growth (t-1)	0.104	-0.371	-0.511	-0.422
	(0.46)	(1.53)	(2.02)**	(1.73)*
Bilateral Ties				
Colony	0.068			
	(3.88)***			
Common Language	0.626			
	(2.91)***			
Distance	0.000			
	(0.00)			
Egypt	0.147			
	(0.35)			
Israel	1.153			
	(1.17)			
Economic Ties (Log)	0.433	0.050	0.066	0.054
	(8.76)***	(1.16)	(1.58)	(1.24)
UN Alignment	0.347	0.587	0.862	0.669
	(1.71)*	(2.17)**	(3.06)***	(2.50)**
Donor Strategic and Coordination				
Herfindahl Index	0.306	1.241	1.184	1.427
	(0.48)	(1.88)*	(2.04)**	(2.33)**
Number of Donors	0.083	0.166		0.185
	(2.04)**	(2.88)***		(3.34)***
Other Donors' Aid (% GDP)		9.536		
		(1.21)		
Constant	-3.287	-43.446	-37.236	-41.313
	(1.34)	(4.19)***	(3.70)***	(4.01)***
Observations	6076	6076	6076	6076
Time Effects	no	yes	yes	yes
Number of pairs		2,098	2,098	2,098
R-squared^	0.23	0.06	0.05	0.06

Robust t statistics in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%
^ Reported R-squared for within variation.

Note that, when we run the regression with the bilateral aid intermediated by multilaterals as the dependent variable (second column), the Herfindahl is not significant. The number of donors is significant, but with a reduced coefficient. The politics variable (UN alignment) is significant in this regression, with a somewhat reduced coefficient compared to the direct bilateral aid regression in the first column.

When we run the regression with the difference between bilateral and bilateral aid intermediated through multilaterals, then we find that both the Herfindahl and the Number of Donors variables are significant. We can conclude that there is evidence for a dilution effect of multilaterals regarding both aid fragmentation (the fact that this variable is not significant in the second column suggests multilateral intermediation may eliminate this problem) and the strategic effects between donors. Note that the coefficient on politics (UN alignment) is not significant in the third column and hence while the coefficient is reduced for multilaterally intermediated aid, statistically there is no evidence for a dilution effect here.[16]

[16] We did find some evidence for a dilution effect above for multilaterally financed aid. See Table 1.

Table 4. Effect of Multilateral Intermediation
(all regressions include pairwise fixed effects)

Model	**(1) Bilateral**	**(2) Bilateral via Multilateral**	**(3) Bilateral - Bilateral via Multilateral (1)-(3)**
Donor Characteristics			
GDP (Log)	-2.240	-1.100	-0.556
	(1.85)*	(3.53)***	(0.40)
Institutional Quality (ICRG Index)	0.711	0.163	0.689
	(3.81)***	(4.56)***	(3.15)***
Recipient Characteristics			
GDP (Log)	-1.700	-0.835	-1.096
	(1.58)	(3.60)***	(0.95)
GDP Per Capita (Log)	0.911	0.522	0.851
	(0.82)	(2.14)**	(0.70)
GDP Per Capita Growth (t-1)	-0.412	-0.159	-0.097
	(1.73)*	(1.86)*	(0.35)
Bilateral Ties			
Economic Ties (Log)	0.071	0.049	-0.018
	(1.72)*	(4.03)***	(0.40)
UN Alignment	0.672	0.437	0.230
	(2.54)**	(5.04)***	(0.83)
Donor Strategic and Coordination			
Herfindahl Index	1.410	0.079	1.756
	(2.34)**	(0.93)	(2.43)**
Number of Donors	0.180	0.045	0.119
	(3.33)***	(4.78)***	(1.78)*
Constant	16.700	9.313	2.466
	(2.12)**	(4.58)***	(0.27)
Observations	6,288	6,157	5,248
Time Effects	yes	yes	yes
Number of pairs	2,239	2,093	1,889
R-squared	0.06	0.14	0.03

Robust t statistics in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%

4.3 Dynamic Panel Representation: GMM

The above panel regressions are static models that do not include the lagged dependent variable and also where some variables may be considered as endogenous. In order to test the robustness of our results, we also ran a dynamic version of these models with fixed effects, including a lagged dependent variable and alternative instrumentation strategies.

Table 5. Politics, Strategic Interaction and Coordination
GMM Estimation with Alternative Instrumentation Strategies

	(1) **Bilateral**	(2) **Bilateral**	(3) **Bilateral via Multilateral**	(4) **Difference (2)-(3)**
(Aid (% GDP)) (t-1)	0.57	0.51	0.33	0.45
	(9.07)***	(8.65)***	(7.15)***	(6.13)***
Donor Characteristics				
GDP (Log)	0.80	1.15	0.51	1.75
	(1.72)*	(1.62)	(5.12)***	(1.33)
Institutional Quality (ICRG Index)	1.02	3.22	0.58	4.35
	(1.80)*	(1.95)*	(1.84)*	(2.48)**
Recipient Characteristics				
loggdp	-0.63	-0.84	-0.01	-0.97
	(2.89)***	(2.89)***	(0.20)	(2.85)***
GDP Per Capita Growth	-0.59	-0.94	-0.06	0.50
	(3.38)***	(2.20)**	(0.94)	(1.03)
GDP Per Capita (Log)	-0.23	-0.02	-0.39	-1.12
	(1.19)	(0.08)	(4.79)***	(1.65)*
Dummy for Natural Disaster	0.05	0.03	-0.07	0.09
	(0.58)	(0.25)	(2.09)**	(0.48)
Bilateral Ties				
Economic Ties (Log)	0.41	0.77	0.06	0.98
	(2.67)***	(2.43)**	(1.89)*	(2.48)**
UN Alignment	0.78	1.24	0.43	0.55
	(2.95)***	(1.87)*	(3.06)***	(0.71)
Donor Strategic and Coordination				
Herfindahl Index	2.09	1.86	0.12	3.05
	(2.26)**	(1.75)*	(0.44)	(1.75)*
Number of Donors	0.26	0.36	-0.01	0.29
	(1.65)*	(1.74)*	(0.50)	(1.17)
Constant	-5.85	-16.32	-2.38	-22.55
	(0.94)	(1.41)	(1.18)	(1.52)
Observations	7,006	7,006	6,581	5,256
Number of pairs	2,153	2,153	2,116	1,768
Time Effects	yes	yes	yes	yes
Hansen test of over-id (p-value)	0.01	0.41	0.00	0.93
AR(1) in first differences	0.00	0.00	0.00	0.01
AR(2) in first differences	0.18	0.14	0.09	0.17

* significant at 10%; ** significant at 5%; *** significant at 1%
Instrument Set of column (1): Recipient Characteristics, Bilateral Ties and Colonial Relationship, Common Language, Distance Egypt and Israel.
Instrument Set of column (2)-(4): Recipient Characteristics and Colonial Relationship, Common Language, Distance Egypt and Israel.

The results are illustrated in Table 5. The first column shows the results of a regression for bilateral aid employing the Blundell-Bond system GMM procedure. In this procedure the levels regression and the first difference regression are performed simultaneously. In this column we use a wide instrument set including past values of the endogenous variables as well as ones which are more clearly exogenous such as colonial relationships, common language, distance and Egypt and Israel dummies.[17] The second column gives the results of the same regression excluding the past values of endogenous variables such as economic and political ties. The Hansen test results indicate that the standard list may not be valid instruments, whereas the second, more clearly exogenous set of variables, are certainly valid according to these tests. However, the results are robust across the two columns.

In particular, we find that the lagged dependent variable is significant. We also find as in our previous regressions that politics is significant. Interestingly we also find that the Economic ties variable is significant. The results on strategic behavior and coordination are quite robust compared to the previous regressions in that the Herfindahl index is significant in all specifications and there is some evidence for a positive coefficient on the total number of donors indicating again, if anything, a positive reaction function, suggesting an "aid for favor" game between donors.

In Column 3 we perform a similar regression but with the bilateral aid intermediated through multilaterals as the dependent variable. Here neither instrument set may be valid, and we only present the results with the second set; the results must therefore be viewed cautiously. Still, as before, we now find insignificant coefficients for the Herfindahl and the Number of Donors variables and, also as before, Politics remains significant. When we perform the difference-in-difference procedure in the final column, the second set of instruments appears to be valid, and again we find evidence of no dilution in Politics. We do, however, again find evidence for dilution in the aid fragmentation effect. The evidence for a dilution effect in the strategic variable (number of donors) but the point coefficient in the regression for bilateral aid intermediated through multilaterals is negative and not significant, so there is no evidence for a strategic effect for this type of aid.

[17] Note that an advantage of using the Blundell-Bond system estimator (that estimates a levels equation and a first difference equation) is that time-invariant variables may be used as instruments.

5. Conclusions

Our general view is that donor countries may face a trade-off regarding whether to channel aid bilaterally or use the intermediary of a multilateral. On the one hand a multilateral may bring benefits in terms of leverage and enhanced coordination, but on the other hand a multilateral may dilute the individual objectives of bilateral donors.

In keeping with the previous literature, we find that for direct bilateral assistance, politics matters. We find that with fixed effects added we cannot reject the hypothesis that politics influences different bilateral donors in the same way, and the relevant pooled coefficient is positive and significant. We also find strong evidence for an aid fragmentation effect. Where aid is more concentrated, then controlling for other factors, recipients receive more aid. Finally, if anything, we find evidence that aid packages from different donors are strategic complements consistent with an aid-for-favor type game.

Multilaterals intermediate in two ways, first financing aid from their own resources built upon the capital initially invested by bilaterals and second more directly through the medium of trust funds and other vehicles that bilaterals may finance but that are managed by the multilaterals. For aid financed by multilaterals we find some evidence for dilution of the effect of politics, especially with reference to World Bank aid. We find little evidence for the dilution of politics in aid intermediated through trust funds and the like, perhaps due to the conditions that are applied to the use of these resources. We find strong evidence that multilaterals solve problems of coordination and of strategic interactions between donors. In short, intermediating through multilaterals may enhance donor coordination, but at some cost in terms of individual bilateral (political) objectives, which is consistent with the idea of a trade-off.

There is much more to be done in this area of research. We have suggested a set of trade-offs, but as yet there is no good theoretical model that captures all of the ideas mentioned. This is an obvious area for future research. As suggested in the introduction, we also believe that there is a link between the determinants of the pattern of aid and its effectiveness. In particular, bilateral aid allocated according to colonial ties or politics may also imply ineffective aid, whereas aid extended due to other donor characteristics may suggest more altruistic motives and perhaps more effectiveness. Finally, aid fragmentation may also lead to less effective aid. These all appear to be interesting avenues for future analysis.

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